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Evaluation of a patented combined water desalination and power generating plant

Fahad AbdulAziz Al-Khaldi

Civil Engineering

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Abstract

A patented cycle for water desalination and power generation was evaluated with regard to thermal efficiency, process chemistry and practicality of main components. The inventor of the cycle claimed that his invetion provides slightly higher thermal efficiency and is environmentally safer than current combined water and power generation plants. The inventor further claimed that his cycle overcomes the temperature limitations of current desalination plants and recovers and separates the various salts present in seawater. A simulation program was developed in order to calculate the thermal efficiency and water production of the process. Results of the simulation were compared with a simulation of Al-Jubail phase-II combined plant.

This study proved that the invented cycle is far inferior to Al-Jubail phase-II plant in terms of water production. Furthermore, the invented cycle does not provide any improvement in thermal efficiency. Moreover, the invented cycle requires higher capital cost, nonconventional industrial equipment and has some practical operating limitations.